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EXAMINER	
EDWARDS, PATRICK L	
ART UNIT	**PAPER NUMBER**
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/504,022	SZELISKI ET AL.	
	Examiner	Art Unit	
	Patrick L Edwards	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The response received on July 27, 2004 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The applicant's arguments, filed on July 27, 2004, have been fully considered. A response to these arguments is provided below.

35 USC § 132 – New Matter Objection

Summary of Argument: The substitute specification was objected to in the previous office action under 35 USC § 132 for introducing new matter into the disclosure. The examiner made four new matter objections (A, B, C, and D) in the prior action to the substitute specification filed on October 17, 2003. Applicant traverses all four of these objections.

In part (A), the examiner objected to the following excerpt of the disclosure: "during a raster transformation of the first and second sets of digital data, multiple images of the digital data are placed in texture memory as multiple textures. Then, statistics are gathered concerning the textures, and the raster transformed sets of digital data are compared and matched against portions of each other" (from sub spec, pg. 13 lines 11-15). The examiner noted that the applicant's originally filed specification did not describe a raster transformation to obtain texture values. The examiner further noted that the original specification did not describe or suggest that the system gathered statistics concerning texture (from sub spec, pg. 5 lines 13-23). Applicant traverses this objection and argues that the cited excerpt is simply explaining that the raster transformed images of one of the sets of digital data are stored in texture memory. Applicant further argues that the gathering of statistics concerning texture is fully supported in the original specification at page 8 lines 2-11 and claim 1.

In part (B), the examiner objected to the following excerpt of the disclosure: "as the data is passed through the rasterization pipeline of the graphics processor, statistics between the textures are gathered and processed via the statistical comparison processor" (from sub spec, pg. 13 lines 26-29). The examiner noted that the original specification never described that the statistical comparison processor gathers statistics between texture values. Applicant traverses this objection and argues that the original specification fully supports and discloses "gathering statistics between textures" on page 16 lines 3-7 in conjunction with Figure 5.

In part (C), the examiner objected to the paragraph at page 16 lines 17-24 of the substitute specification, which describes that the system gathers statistics between color values. The examiner asserted that the originally filed specification does not describe the use of color values for performing statistical comparisons. Applicant traverses this objection and argues that the original specification, at page 14 lines 13-19 and page 11 lines 5-11, fully supports the use of color values in performing statistical comparisons.

In part (D), the examiner objected to the following excerpt of the disclosure: "it has been observed that textured triange rasterization performed in a conventional graphics processor or the like closely resembles sparse matching of a template with an image" (sub spec, pg. 23 lines 1-3). The examiner noted that the originally filed specification did not describe such an equivalence between textured triangle rasterization and template matching. Applicant traverses this objection and argues that this comparison is clearly described on page 16, lines 3-10 of the originally filed specification. Specifically, applicant argues that the original specification explains that the template is treated as a texture, and triangular polygon display primitives are used for rendering purposes.

Examiner's Response: Referring to part (A) of the objection, applicant's arguments have been fully considered but are not persuasive. The originally filed specification explicitly and repeatedly describes that a first set of digital data represents a template (also described as an 'object' or a 'portion of an image'), and a second set of digital data represents an image. The disclosure makes it abundantly clear that a "template" is not an image in and of itself, but merely represents an 'object' located in an image. The disclosure describes that an image is stored in a frame buffer, while an object or template contained within the image is stored in texture memory. Additionally, the original specification explicitly and repeatedly describes transform *either* the template *or* the image. The substitute specification recites that "during a raster transformation of the first and second sets of digital data, multiple images of the digital data are placed in texture memory as multiple textures." This statement adds new matter in three different respects. First of all, the original specification does not support a transformation of both the first and second sets of digital. As was stated above, the original specification described transforming one or the other, but not both. Secondly, the original disclosure does not support storing images in the texture memory. As was stated above, the original specification explicitly stated that the texture memory stored objects or templates of an image, it failed to disclose that the texture memory stored images. Finally, the original disclosure does not support disclose representing an image as a texture. It has support for representing a template as a texture, but not for representing an image as a texture. Thus, the examiner correctly noted the existence of new matter in the substitute specification, and the prior objection to page 13, lines 11-15 of the substitute specification was proper and will not be withdrawn.

Further referring to part (A) of the objection, applicant argues that the objection to page 5 lines 13-23 of the substitute specification regarding the gathering of statistics concerning texture is improper because this feature is supported in the original specification at page 10 lines 11-19. However, the excerpt cited by the applicant merely supports the gathering of statistics between two colors. It does not support gathering statistics concerning texture. The original specification did not explicitly define the term 'texture', so the examiner has defined this term as it is known in the art (i.e. the degree of smoothness of an object surface). In the applicant's remarks, it appears as if the terms 'texture value' and 'color' are being analogized. This interpretation, however, is without support from the original specification and goes against the art-accepted definition of the term 'texture'. Therefore, the examiner correctly noted the existence of new matter in the substitute specification, and the prior objection to page 5, lines 13-23 of the substitute specification was proper and will not be withdrawn.

Referring to part (B) of the objection, applicant's arguments have been fully considered but are not persuasive. The above argument (from part (A)) regarding the gathering of statistics concerning texture is

incorporated herein. At page 13, lines 26-29, the substitute specification states that "as the data is passed through the rasterization pipeline of the graphics processor, statistics between the textures are gathered and processed via the statistical comparison processor". However, the originally filed specification never describes that the statistical comparison processor gathers statistics between texture values. On page 12, lines 1-14, the original description describes that the statistics accumulated by the statistics comparison processor are a cross-correlation coefficient, the sums of pixel values, the sum of the product of pixel values, the sums of the squares of pixel values, and pixel count. The original specification does not describe or suggest gathering statistics between textures. Applicant argues that the original specification fully supports this feature, and relies on an excerpt from page 16 lines 3-7 of that specification, what states the following: "instead of rasterizing the texture into the frame buffer, certain statistics can be recorded for normalized correlation or other statistics can be recorded for variations". Applicant is apparently making the assumption that the normalized correlation or variation statistics are determined with respect to the texture. However, the cited excerpt does not support such an assumption. Therefore, the examiner correctly noted the existence of new matter in the substitute specification, and the prior objection to page 13 lines 26-29 of the substitute specification was proper and will not be withdrawn.

Referring to part (C) of the objection, applicant's arguments have been fully considered and are persuasive. The new matter objection to page 16, lines 17-24 of the substitute specification was made in error, and is hereby withdrawn.

Referring to part (D) of the objection, applicant's arguments have been fully considered, but are not persuasive. Applicant has cited an excerpt from the original specification (page 16, lines 3-10), and argues that this excerpt provides full support. The examiner disagrees. The cited excerpt might initially appear relevant to the statement that 'textured triangle rasterization ... closely resembles sparse matching of a template with an image'. The excerpt mentions a triangular polygon, texture rasterization, and normalized correlation—all of which are concepts relevant to the statement in question. However, the mere mentioniong of these concepts in the same paragraph is insufficient support for a statement that explicitly analogizes these concepts, and closely ties them together. Therefore, the examiner correctly noted the existence of new matter at page 23, lines 16-19 of the substitute specification. The prior objection was proper, and therefore will not be withdrawn.

37 CFR § 1.75 Claim Objections

Summary of Argument: In the previous office action, claim 18 was objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. Applicant has subsequently cancelled claim 18.

Examiner's Response: As a result of the claim cancellation, the prior objection is a moot issue.

Prior Art Rejections

Summary of Argument: Applicant traverses the rejection of claim 6 under 35 USC 102b as being anticipated by Sacks et al. (USPN 4,736,437). Applicant argues that Sacks fails to teach, suggest, or disclose the claimed features of "rendering model transformations" and/or "adjusting model transformation". Applicant further argues that Sacks teaches away from performing such transformations (applicant's remarks, pg. 13-16).

Examiner's Response: Applicant's arguments have been fully considered but are not persuasive. Applicant relies on the fact that the image rotation in Sacks is accomplished by reading out the data in memory along a scan direction that is offset by an angle theta from the original information. An image transformation is well known in the art as an algorithm that takes an image, alters it, and outputs a new image. The Sacks reference, therefore, discloses an image transformation. The examiner is aware that the rotation disclosed in Sacks is not performed in a manner identical to the instant invention. This is inconsequential. Applicant is reminded that limitations from the specification are not read into the claims, and that claims are to be given their broadest reasonable interpretation (see MPEP §§ 2111, and 2145).

Summary of Argument: Applicant traverses the rejection of claims 1-5 under 35 USC 103, and argues that the combination of Sacks and Segal fails to disclose all of the limitations of the amended claim 1 (see applicant's remarks pg. 17-20). More specifically, applicant argues that the combination fails to teach, suggest, or disclose a statistical processor which performs statistical comparisons between sets of digital data depending on the results of a pixel acceptance test following raster transformation of one or both of the sets of digital data.

Examiner's Response: Applicant's arguments have been fully considered but are not persuasive. First, the applicant's argument that the Segal reference does not teach all of the claimed limitations is considered irrelevant. The previous action merely incorporates the Segal reference for the purposes of showing a graphics card which incorporates a statistics processor (see previous action pgs. 8-9). The Sacks reference, on the other hand, is used to show the specifics of the claimed statistics processor. Applicant argues that this reference fails to teach the raster transformation as recited in the claim. This argument has been addressed with respect to claim 6 above, and will not be repeated. Applicant's amendment to claim 1 make the language of the claim mirror that of claim 6, but does not further limit the claim. Thus, all of the limitations of the claim have been fully addressed in the previous rejection and the above argument with respect to claim 6.

Summary of Argument: Applicant traverses the rejection of claim 9 under 35 USC 103, and argues that there would be no motivation to combine Neff and Segal (see applicant's remarks pg. 21). Applicant further argues that the examiner incorrectly characterized the applicant's admitted prior art, and that the limitation which has been added to the amdended claim 9 is not admitted prior art as suggested by the examiner and that this limitation is not taught by the combination of Neff and Segal (see applicant's remarks pg. 22-23).

Examiner's Response: First, the applicant's argument that there is no motivation to combine the references because such a combination would increase the size of the circuitry, which tends to increase the cost of the graphics card is not persuasive. Applicant's assertion that the incorporation of a statistics processor on the graphics card would result in additional circuitry and therefore additional cost is incorrect on two levels. First of all, this combination would not result in additional circuitry, but would simply result in more modular circuitry, since the statistics processor is included on the graphics card. Secondly, if we assume, arguendo, that this combination would result in additional circuitry, the examiner asserts that this additional processor (on the graphics card) merely shifts the circuitry onto the graphics card, from elsewhere in the system. This would not increase the cost, but would increase efficiency by placing related circuitry close together in proximity.

With regard to applicant's arguments regarding the limitation from cancelled claim 18 that was added to the amended claim 1, the examiner agrees that the previous office action contained a misinterpretation of the disclosure, and that this limitation was not admitted prior art as was previously stated. Therefore, the examiner agrees with the applicant's assertion that the combination of Neff, Segal, and well known prior art is insufficient to teach all of the claimed limitations. The examiner, however, disagrees with the assertion that this claim is now allowable over the prior art. A new rejection will be provided below which addresses the limitation in question. Since the new rejection was necessitated by the examiner's misinterpretation of the disclosure, this office action will not be made final.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sacks et al. (U.S. Patent No. 4,736,437 A).

As applied to claim 6, Sacks et al. discloses a method for comparing and matching a first set of digital data to at least a second set of digital data, comprising: loading at least one of the first and second sets of digital data into a first memory device (see Fig. 1: Digital data is loaded into reference memory 16.); using a 3D rendering device for rendering model transformations and accumulating statistics of the loaded digital data, said 3D graphics rendering device modified to include a statistical processor (see Fig. 3 and column 10, line 61 – column 11, line 13: The reference describes that the angle rotator initially rotates the scanning line of the information stored in the reference memory 16 (i.e. rendering model transformations). This information is then convolved with the information in the video memory 20 and these values are accumulated by accumulator 24 (i.e. accumulating statistics). Convolver 22 is equivalent to the claimed statistical processor. (Note: The specification describes that a 3D rendering device is

equivalent to a graphics rasterizer. Therefore, the overall system is a graphics rendering device.)); adjusting the model transformations based on the accumulated statistics (see Fig. 1: The accumulator 24, which accumulates the results from the convolver 22, sends information (i.e. accumulated statistics) to the CPU 10. The CPU 10 then uses this information to adjust the angle of rotation used by the rotator 18 to rotate the reference image (i.e. model transformation).); and statistically comparing and matching the model transformations of the loaded set of digital data to appropriately corresponding portions of the other set of digital data (see Fig. 1: The data is statistically compared and matched by the convolver 22).

As applied to claim 7, Sacks et al. discloses statistically comparing the sets of digital data until a match or non-match between the first and second sets of data is achieved (see column 8, lines 23-29: The reference describes accumulating information (i.e. statistically comparing) until the CPU 10 determines a best match (i.e. until a match or non-match between the first and second sets of data is achieved).).

As applied to claim 8, Sacks et al. discloses adjusting the models comprises analyzing the statistical comparisons and generating new transformations for matching the sets of data (see Fig. 1: The results of the convolution (i.e. computed statistics) are accumulated by accumulator 24 and then sent to CPU 10 where the results are analyzed. The CPU then sends information to rotator 18 so that different transformations can be performed on the reference image.).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sacks et al. (U.S. Patent No. 4,736,437 A), Segal et al. (the book titled "The OpenGL® Graphics System: A Specification (Version 1.2.1)"), and further in combination with well-known prior art.

As applied to claim 1, the applicant describes that the system can be embodied in a conventional computer graphics card that has been modified to include the statistical comparison processor (see applicant's specification: page 4, lines 26-27). Therefore, it is well known in the prior art to use a computer graphics card for raster transforming at least one of the first set of digital data and the second set of digital data and performing a pixel acceptance test using a pixel acceptance tester. However, it is not well known in the prior art to a) perform a statistical comparison between part of each of the first set for digital data and the second set of digital data, wherein

the statistical comparison includes statistically comparing and matching the raster transformed sets of digital data to appropriately corresponding portions of each other and b) to include the statistical processor in the computer graphics card.

Regarding difference b), Segal et al. discloses a graphics card with an included statistics processor (see page 234, section D.9.4: The reference describes a software interface to graphics hardware that allows for the accumulation of statistical information regarding pixels (i.e. statistics processor).).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the well known graphics card by adding a statistics processor as taught in Segal et al. because the use of such a configuration would decrease the size and the cost of the system, thus increasing overall efficiency.

Regarding difference a), Sacks et al., in the same field of endeavor of image processing, discloses performing a statistical comparison between part of each of the first set for digital data and the second set of digital data using a statistical processor, wherein this comparison includes statistically comparing and matching the raster transformed sets of digital data to appropriately corresponding portions of each other (see Figs. 1, 3, and column 10, line 61 – column 11, line 13: The reference describes that an angle rotator initially rotates the scanning line of the information stored in the reference memory 16 (i.e. raster transformed information). This information is then convolved with the information in the video memory 20 and these values are accumulated by accumulator 24 (i.e. accumulating statistics). This data is then statistically compared and matched by the convolver 22.).

As applied to claim 2, Sacks et al. discloses analyzing the statistical comparisons and generating new transformations for matching the sets of data (see Fig. 1: The statistical comparisons are analyzed by the CPU 10 and then new transformations are generated by the rotator 18.).

As applied to claim 3, Sacks et al. discloses statistically comparing the raster transformed sets of digital data until a match or non-match between the first and second sets of data is achieved (see column 8, lines 23-29: The reference describes accumulating information (i.e. statistically comparing) until the CPU 10 determines a best match (i.e. until a match or non-match between the first and second sets of data is achieved).).

As applied to claim 4, Sacks et al. discloses raster transforming comprises raster transforming at least one of the first or the second set of digital data and computing statistics on the transformation (see Fig. 1: The raster transform in Sacks comprises rotating the reference image and then convolving it with the video image (i.e. computing statistics). This process is then repeated and the results of the convolution are accumulated by accumulator 24.).

As applied to claim 5, Sacks et al. discloses that statistically comparing and matching comprises analyzing the computed statistics of the transformation and calculating new and different transformations on the digital data (see Fig. 1: The results of the convolution (i.e. computed statistics) are accumulated by accumulator 24 and then sent to CPU 10 where the results are analyzed. The CPU then sends information to rotator 18 so that different transformations can be performed on the reference image.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of the conventional graphics card and statistics processor taught by Segal et al. by adding

the specific processing steps taught in Sacks et al. because the use of such processing steps allows the system to operate "with a minimal amount of memory" and to "implement all procedures in fast real time hardware" (see Sacks et al.: column 5, lines 27-29).

7. Claims 9-17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Neff et al. (U.S. Patent No. 5,809,171 A), Segal et al. (the book titled "The OpenGL® Graphics System: A Specification (Version 1.2.1)"), Skoglund et al. (USPN 6,418,243) and further in combination with well-known prior art.

As applied to claim 9, the applicant describes that the system can be embodied in a conventional computer graphics card that has been modified to include the statistical comparison processor (see applicant's specification: page 4, lines 26-27). Therefore, it is well known in the prior art to use a computer graphics card including a raster transformer that transforms at least one of the templates.

Claim 9 also calls for elements that are not well known in the prior art including a) a statistics enable switch wherein accumulation of information for each digital template is enabled when said statistics enable switch is enabled, b) a statistical compare processor included in the computer graphics card, and c) accumulating information for each digital template and statistically comparing and matching images associated with the templates for tracking the templates based on the accumulated information.

Regarding difference b), Segal et al. discloses a graphics card with an included statistics processor (see page 234, section D.9.4: The reference describes a software interface to graphics hardware that allows for the accumulation of statistical information regarding pixels (i.e. statistics processor).).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the well known graphics card by adding a statistics processor as taught in Segal et al. because the use of such a configuration would decrease the size and the cost of the system, thus increasing overall efficiency.

Regarding difference a) Segal et al. discloses a graphic card with switches that enable or disable certain features (see Fig. 2.10: As can be seen in the figure, the device has switches for enabling certain features.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the well known graphics card by adding an enabling switch as taught in Segal et al. because the use of such a switch will decrease processing time since information will only be accumulated when necessary.

Regarding difference c), Neff et al. discloses accumulating information for each digital template and statistically comparing and matching images associated with the templates for tracking the templates based on the accumulated information (see Fig. 1: Block 34 represents the correlation means and block 28 represents the comparison means. These devices are used to determine the correlation between the template and test image. The comparison means 28 also includes means for separately comparing each of the temporally distinct test images to the template (i.e. tracking).).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the combination of the conventional graphics card and statistics processor taught by Segal et al. by adding the specific processing steps taught in Neff et al. because the use of such processing allows the system to "rapidly compare a test image to a template to determine the correlation X therebetween with little, if any, modeling or mensuration required" (see Neff et al.: column 7, lines 10-12).

With regard to the added limitation that the statistical compare processor allows the use of pixel alpha values for weighting statistical information, the applicant's admitted prior art describes that it is conventional to weight the computed statistics. The applicant's admitted prior art fails to expressly disclose that a pixel alpha value can be used to weight statistics. Skoglund, however, discloses using alpha values to weight statistics (Skoglund col. 12 lines 26-39). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Neff's statistical processing by weighting the statistics with alpha values as taught by Skoglund. Such a modification would have allowed for a way of weighting the statistics in order to produce a more consistent, constrained result (Skoglund col. 10 lines 60-66).

As applied to claims 10-12, which call for the computer graphics card to include an address generator, the applicant has disclosed that such an address generator is conventional in the art (see applicant's specification: page 12, lines 4-6).

As applied to claim 13, which calls for the computer graphics card to include an acceptance tester, the applicant has disclosed that an acceptance tester is conventional in the art (see applicant's specification: page 15, lines 12-22).

As applied to claim 14, as applied to claim 14, Neff et al. discloses that the color values are sent to a statistics/comparison device for statistical analyses and comparison processing (see column 11, lines 34-51: The color values are the gray level values of each of the labels (i.e. regions) of the template. These values are used by the correlation means and comparison means to determine the correlation.).

As applied to claim 15, Neff et al. discloses that the statistics/comparison device contains variables that are updated for each pixel based on the input color values of each pixel (see column 11, lines 23-33: The reference describes the use of N values that are used by the correlation and comparison means to determine the correlation (i.e. the statistics/comparison device contains variables that are updated for each pixel). These values are based on the gray level of a particular area (i.e. based on the input color values).).

As applied to claim 16, Neff et al. discloses that the statistical analyses compares and matches the template to the image by initially defining a function that estimates the similarity between the template and the image (see column 11, lines 34-51: The reference describes equation (1) that is used to determine the correlation X (i.e. defining a function that estimates the similarity between the template and the image).).

As applied to claim 17, Neff et al. discloses that the template is located in the image by computing the function at various locations in the image and determining where the function is maximized (see column 19, lines 10-20: The reference describes a system processor that determines the relative offset between the template image and the test image (i.e. the template is located in the image by computing the function at various locations in the

image) that provides the greatest correlation between the two images (i.e. determining where the function is maximized).).

As applied to claim 19, Neff et al. discloses raster processor renders the template at a plurality of offsets for allowing the raster processor to at least one of determining a desired position for the template and accumulate information to analytically compute a desired update (see Fig. 1, column 12, lines 66-67, and column 13, lines 1-3: The reference describes an offset means 36 for creating offsets between the template and test image (i.e. renders the template at a plurality of offsets) such that the template is compared to any number of different regions of the test image (i.e. allowing the raster processor to determine a desired position for the template).).

As applied to claim 20, Neff et al. discloses the offsets are fractional perturbations to vertices of the templates (see column 18, lines 20-39: The reference describes an offset means that allows pieces of the template to be compared to several different portions of the test image. Therefore, the offsets are fractional perturbations, since only a portion of the template moves across the image, of the vertices of the templates, since the edges of the template define the offsets).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick L Edwards

Art Unit 2621

ple

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